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Ziaie et al.

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(54) **LASER-SCRIBED FERROGEL SENSOR WITH MAGNETIC PARTICLES**

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(58) **Field of Classification Search**

None
See application file for complete search history.

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(57) **ABSTRACT**

A method of making a sensor includes depositing a layer of hydrogel over a substrate, the hydrogel configured to change thickness or volume in response to a selected condition and including a plurality of magnetic particles disposed in the hydrogel so that a magnetic property of the hydrogel changes with changes of thickness or volume of the hydrogel. The hydrogel is sacrificed in selected region(s) of the layer so that the hydrogel outside the selected region(s) forms a plurality of spaced-apart islands of the hydrogel. The islands of the hydrogel are enclosed in an enclosure at least partly permeable to a selected fluid. A sensor for detecting a condition includes the substrate, islands, and a device coil arranged with respect to the hydrogel so that changes in the magnetic property modulate an electrical property of the sensor. A system includes the substrate, islands, and a magnetic-field detector.

25 Claims, 43 Drawing Sheets

